IFFO RS Limited

T: +44 (0) 2030 539 195
E: Standards@iffors.com
W: www.iffors.com

Unit C, Printworks | 22 Amelia Street
London, SE17 3BZ | United Kingdom

Global Standard for Responsible Supply of Marine Ingredients

Fishery Assessment Methodology and Template Report V2.0

Fishery Under Assessment	European Pilchard *Sardina pilchardus* FAO 34 Zones A, B, C)
Date	January 2020
Assessor	Jim Daly

Application details and summary of the assessment outcome				
Name: TC Union Agrotech Ltd				
Address:				
Country: Thailand		**Zip:**		
Tel. No.:		**Fax. No.:**		
Email address:		**Applicant Code:**		
Key Contact:		**Title:**		
Certification Body Details				
Name of Certification Body:		**SAI Global Ltd**		
Assessor	**Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-approval**	**Whole fish/ By-product**
Jim Daly	Vito Romito	0.5	Re-approval	By-product
Assessment Period	2019			

Scope Details		
Management Authority (Country/State)	Ministre de l'Agriculture et de la Pêche maritime (Maroc); EU; Russia	
Main Species	European Pilchard *Sardina pilchardus*	
Stock:	FAO 34. Zones A, B, C only	
Fishery Location	Atlantic Eastern Central	
Gear Type(s)	Purse seine, pelagic trawl, artisanal	
Outcome of Assessment		
Overall Outcomes:	**Outcome**	**Clause(s) failed**
European Pilchard *Sardina pilchardus*	PASS	NONE
Peer Review Evaluation	PASS	
Recommendation	**APPROVE**	

Assessment Determination
If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in the CITES appendices, it cannot be approved for use as an IFFO RS raw material. European Pilchard does not appear as Endangered or Critically Endangered on the IUCN Red List, nor does it appear in the CITES appendices; therefore, European Pilchard is eligible for approval for use as IFFO RS raw material. One stock forms part of this assessment: 1) FAO 34. Zones A, B, C (**Figure 1**). Fishery removals of the stock is considered in the various stock assessment processes so the stock **PASSES** Clause C1.1. For European Pilchard the most recent estimated spawning stock biomass (SSB) is above Blim and removals are not considered to be negligible therefore, the stock also **PASSES** Clause C1.2. In order to be approved, each stock assessed must pass both Clause C1.1 and C1.2; therefore: 1) European Pilchard is **APPROVED b**y SAI Global assessors in the assessment area for the production of fishmeal and fish oil under IFFO RS v 2.0 by-products standard.
Peer Review Comments
Fishery removals of European Pilchard are considered in the various stock assessment processes. The most recent estimated spawning stock biomass (SSB) is above Blim and B_{MSY}. The reviewer agrees that European Pilchard in the assessment area be approved for the production of fishmeal and fish oil under IFFO RS v 2.0 by-products standard.
Notes for On-site Auditor

HOW TO COMPLETE THIS ASSESSMENT REPORT

By-products

The process for completing the template for **by-product raw material** is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table with the names of the by-product species and stocks under assessment. The '% landings' column can be left empty; all by-products are considered as Category C and D.
2. IF THERE ARE CATEGORY C BYPRODUCTS UNDER ASSESSMENT: Complete clause C1 for **each** Category C by-product.
3. IF THERE ARE CATEGORY D BYPRODUCTS UNDER ASSESSMENT: Complete Section D.
4. ALL OTHER SECTIONS CAN BE DELETED. Clauses M1 - M3, F1 - F3, and Sections A and B do not need to be completed for a by-product assessment.

By-product approval is awarded on a species-by-species basis. Each by-product species scoring a pass under the appropriate section may be approved against the IFFO RS Standard.

SPECIES CATEGORISATION

The following table should be completed as fully as the available information permits. Any species representing more than 0.1% of the annual catch should be listed, along with an estimate of the proportion of the catch each species represents. The species should then be divided into Type 1 and Type 2 as follows:

- **Type 1 Species** can be considered the 'target' or 'main' species in the fishery. They make up the bulk of annual landings and are subjected to a detailed assessment.
- **Type 2 Species** can be considered the 'bycatch' or 'minor' species in the fishery. They make up a small proportion of the annual landings and are subjected to relatively high-level assessment.

Type 1 Species must represent 95% of the total annual catch. Type 2 Species may represent a maximum of 5% of the annual catch (see Appendix B).

Species which make up less than 0.1% of landings do not need to be listed (NOTE: ETP species are considered separately). The table should be extended if more space is needed. Discarded species should be included when known.

The 'stock' column should be used to differentiate when there are multiple biological or management stocks of one species captured by the fishery. The 'management' column should be used to indicate whether there is an adequate management regime specifically aimed at the individual species/stock. In some cases, it will be immediately clear whether there is a species-specific management regime in place (for example, if there is an annual TAC). In less clear circumstances, the rule of thumb should be that if the species meets the minimum requirements of clauses A1-A4, an adequate species-specific management regime is in place.

NOTE: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in the CITES appendices, it **cannot** be approved for use as an IFFO RS raw material. This applied to whole fish as well as by-products.

TYPE 1 SPECIES (Representing 95% of the catch or more)
Category A: Species-specific management regime in place.
Category B: No species-specific management regime in place.

TYPE 2 SPECIES (Representing 5% OF THE CATCH OR LESS)
Category C: Species-specific management regime in place.
Category D: No species-specific management regime in place.

Common name	Latin name	Stock	% of landings	Management	Category
European pilchard	*S. pilchardus*	FAO 34	n/a	Morocco/EU/Russia	C

CATEGORY C SPECIES

In a whole fish assessment, Category C species are those which make up less than 5% of landings, but which are subject to a species-specific management regime. In most cases this will be because they are a commercial target in a fishery other than the one under assessment. In a by-product assessment, Category C species are those which are subject to a species-specific management regime and are usually targeted species in fisheries for human consumption.

Clause C1 should be completed for **each** Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. A Category C species does not meet the minimum requirements of clause C1 should be re-assessed as a Category D species.

Species Name		**European Pilchard *Sardina pilchardus***	
C1	**Category C Stock Status - Minimum Requirements**		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process OR are considered by scientific authorities to be negligible.	**PASS**
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	**PASS**
Clause outcome:			**See above**

C1.1
Evidence
This assessment covers FAO 34 in the areas outlined in **Figure 1**:

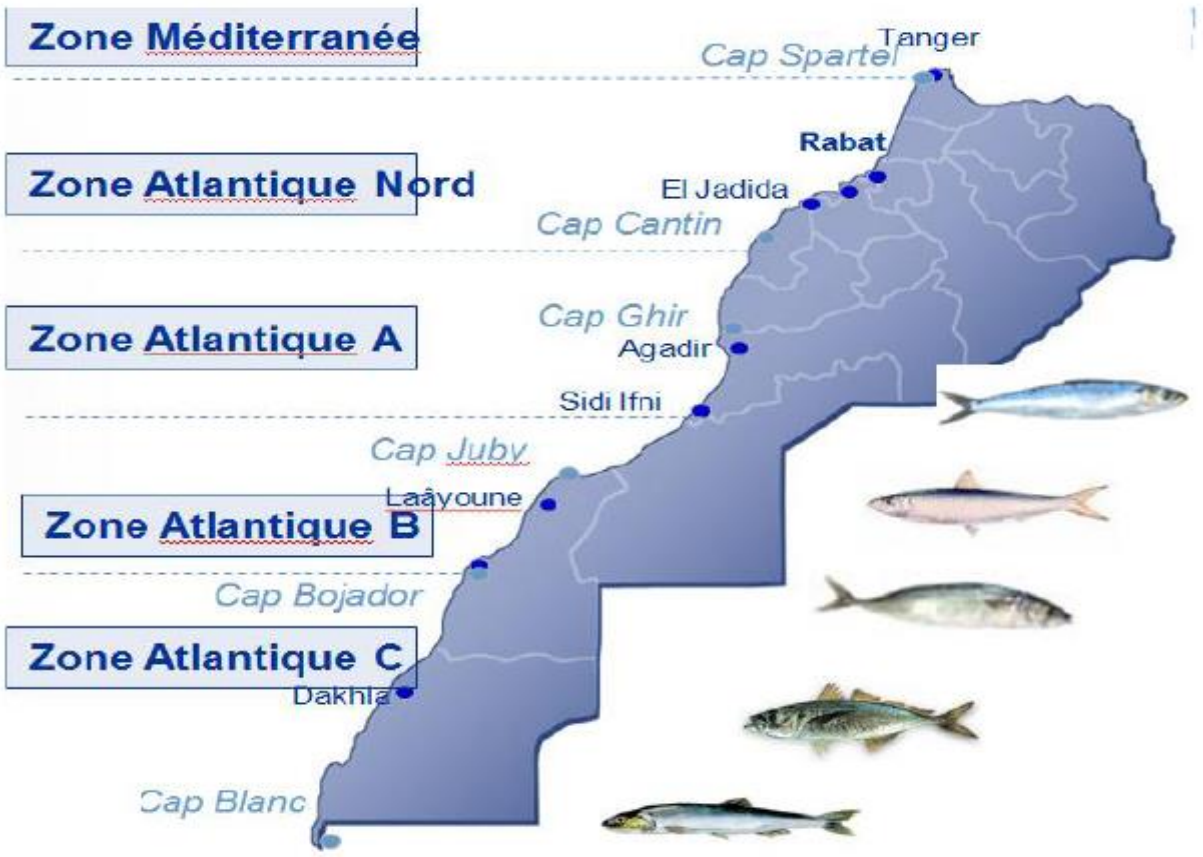

Figure 1 Fishing zones for management purposes off the Moroccan Coast **R1**

Three fleets prosecute this fishery. The coastal seiner fleet (all zones); the Refrigerated Sea Water (RSW) trawler fleet (zone C) and the EU / Russian freezer trawler fleet operating under agreements with Morocco (zone C). Licensed vessels are required to submit logbooks and landings declarations, and there appear on this basis to be good statistics on catch and effort.

The Committee for Eastern Central African Fisheries (CECAF) and Morocco's Institut National de Research Halietique (INRH) use a Schaefer dynamic production model to evaluate stocks but have also experimented with other models and may expand to use more up-to-date Bayesian analysis techniques in the future. For the production model, the Working Group (2018) used total sardine catches in Zones A+B and Zone C for the years 1995 to 2016.

C1.2
Evidence
Results of the most recent assessment (Stock A & B) indicate that current stock biomass is higher than target biomass B0.1 and B_{MSY}:

Table 1: Results of fitting the Schaefer dynamic production model for the Stock A+B of Sardina pilchardus **R1**

Stock/abundance index	B_{cur}/B_{MSY}	$B_{cur}/B_{0.1}$	F_{cur}/F_{Sycur}	F_{cur}/F_{MSY}	$F_{cur}/F_{0.1}$
Sardine, Zones A+B/ Nansen (1995-2016) / *Al Amir Moulay Abdellah* index in 2015 and 2016	152%	138%	99%	40%	44%

For Stock C reference points derived from the application of the model for this stock show that the current biomass level is far above the target biomass B0.1 and B_{MSY}:

Table 2: Results of fitting the Schaefer dynamic production model for Stock C Sardina pilchardus **R1**

Stock/abundance indices	B_{cur}/B_{MSY}	$B_{cur}/B_{0.1}$	F_{cur}/F_{Sycur}	F_{cur}/F_{MSY}	$F_{cur}/F_{0.1}$
Sardine, Zone C/ Nansen (1995-2015)	152%	138%	110%	53%	58%
Sardine, Zone C/ Nansen (1995-2016)	144%	131%	111%	62%	69%

B_{cur}/B_{MSY} : Ratio between the estimated biomass for the last year of the series and the biomass corresponding to $F_{0.1}$.
$B_{cur}/B_{0.1}$: Ratio between the estimated biomass for the last year of the series and the biomass corresponding to $F_{0.1}$.
F_{cur}/F_{Sycur} : Ratio between the observed fishing mortality coefficient for the last year of the series and that which would give a sustainable catch for the current biomass.
F_{cur}/F_{MSY} : Ratio between the observed fishing mortality coefficient for the last year of the series and that which would give a maximum sustainable yield over the long-term.
$F_{cur}/F_{0.1}$: Ratio between the fishing mortality coefficient observed for the last year of the series and $F_{0.1}$.

Different stocks of sardine are indicated to be in conditions of full or less than full exploitation, except for the Mediterranean stock, which is deemed overexploited. INRH consider sardines in the Central Zone to be in a state of non-full exploitation.

References

R1 FAO WORKING GROUP (2018) ON THE ASSESSMENT OF SMALL PELAGIC FISH OFF NORTHWEST AFRICA 298pp Nouadhibou, Mauritania
http://www.fao.org/3/i8896b/I8896B.pdf
R2 Fishsource (2019) S. pilchardus NW Africa Stock https://www.fishsource.org/stock_page/781
R3 Institut National de Research Halietique (INRH) 2016. Etat des stocks et des pêcheries Marocaines http://www.inrh.ma/fr/publications/etat-des-stocks-et-des-p%C3%AAcheries-marocaines-2016

Standard clauses 1.3.2.2